

WHAT IS CLAIMED IS:

1. A method of producing polyisocyanates of the diphenylmethane series comprising:

5

- a) reacting aniline and formaldehyde in the presence of HCl to provide a product mixture containing polyamines of the diphenylmethane series, HCl, aniline and water;
- b) removing excess aniline and water by distillation to provide a product mixture comprising polyamines of the diphenylmethane series, HCl, no more than 10 wt.% aniline based on the polyamines, and no more than 5 wt.% water based on the polyamines; and
- c) phosgenating the product mixture in (b).

15

2. The method according to Claim 1, wherein the distillation is performed in the presence of an entrainer.

- 20 3. The method according to Claim 1, wherein the distillation is performed by a method comprising removing aniline by distillation in the presence of water as entrainer; and removing water by distillation.

- 25 4. The method according to Claim 1, wherein, the product mixture in (b) comprises no more than 2 wt.% aniline based on the polyamines, and no more than 1 wt.% water with based on the polyamines.

5. The method according to Claim 2, wherein, the product mixture in (b) comprises no more than 2 wt.% aniline based on the polyamines, and no more than 1 wt.% water with based on the polyamines.

30

6. The method according to Claim 3, wherein, the product mixture in (b) comprises no more than 2 wt.% aniline based on the polyamines, and no more than 1 wt.% water with based on the polyamines.
- 5 7. The method according to Claim 1, wherein the product mixture in (b) comprises no more than 0.2 wt.% aniline based on the polyamines, and no more than 0.1 wt.% water based on the polyamines.
8. The method according to Claim 2, wherein the product mixture in (b) comprises no more than 0.2 wt.% aniline based on the polyamines, and no more than 0.1 wt.% water based on the polyamines.
- 10 9. The method according to Claim 3, wherein the product mixture in (b) comprises no more than 0.2 wt.% aniline based on the polyamines, and no more than 0.1 wt.% water based on the polyamines.
- 15